REMARKS/ARGUMENTS

Favorable reconsideration of this Application, as presently amended and in light of the following discussion, is respectfully requested.

This Amendment is in response to the Office Action mailed on June 30, 2005. Claims 1-20 are pending in the Application, Claims 1-3, 11, 12, 14, and 15 stand rejected, and Claims 4-10 and 13 have been objected to as being dependent upon rejected base claims, but would be allowed if rewritten in independent form. Claims 1, 2, 5, and 15 are amended and new Claims 16-20 are added by the present Amendment.

The indication of allowable subject matter is noted with appreciation. However, because Claim 1, as presently amended, is believed to contain allowable subject matter, Claims 4-10 and 13 are maintained in their dependant form at this time.

Summarizing the outstanding Office Action, the drawings and the abstract of the disclosure were objected to because of informalities; Claims 1-3, 11, and 12 were rejected under 35 U.S.C. §102(b) as being anticipated by the Applicants' admitted prior art (hereinafter "AAPA"); Claims 1-3, 11, 12, and 14 were rejected under 35 U.S.C. §102(b) as being anticipated by Lee (U.S. Patent No. 3,945,758); and Claims 1 and 15 were rejected under 35 U.S.C. §102(b) as being anticipated by Correia et al. (U.S. Patent No. 5,358,374, hereinafter "Correia").

Claim 15 is amended to recite that the annular upstream and downstream plates are separate and distinct from each other and a new abstract of the disclosure is submitted, thus obviating the outstanding objections to Applicants' figures and abstract. Applicants respectfully request reconsideration of those objections. In addition, minor informalities have also been corrected in three paragraphs of the specification. No new matter has been added by those corrections and entry of the same is respectfully requested.

Applicants respectfully submit that Claim 1 is not anticipated by AAPA, Lee, or Correia because each and every element as set forth in that claim is not found, either expressly or inherently described, in the cited reference. In an anticipation rejection, the identical invention must be shown in as complete detail as is contained in the claim.[1]

According to a feature of the invention as set forth in Claim 1, a cooling device for cooling disks of high- and low-pressure turbines of a turbomachine is recited, comprising, among other features, upstream and downstream annular plates extending radially from upstream and downstream flanges from a bottom platform to define at least one cooling air annular cavity, and a sealing device extending longitudinally between the upstream and downstream plates so as to close the cooling air cavity in a leaktight manner. This annular cavity includes a top zone fed with cooling air by air orifices in the bottom platform and by a bottom zone in communication with the top zone via a plurality of openings, the bottom zone being in radial alignment with the air orifices and the openings.

As disclosed in the Specification, a drawback of conventional disc cooling devices is the fact that head losses are unnecessarily generated because of the large changes in direction of the cooling air flow coming from link bushings connecting air supply holes on a vane supporting base to a cavity with air ejecting holes from which air is discharged for cooling the disks. In addition, because these conventional devices are made from at least three separate annular plates fixed to a bottom platform, not only is the cost of the final product increased and their manufacturing process made more complex, but preventing undesirable air leaks to occur is more difficult.[2] The two-zone cooling cavity of the present invention,

---

[1] See MPEP 2131: "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," (Citations omitted) (emphasis added). See also MPEP 2143.03: "All words in a claim must be considered in judging the patentability of that claim against the prior art."

[2] Specification, page 1, line 12 – page 2, line 23.

being made of two annular plates and having a bottom portion and the openings connecting the bottom and top portions in radial alignment with the orifices that supply air to the cavity, eliminates or significantly reduces the above-noted problems of conventional disk cooling devices. Claim 1 is amended to more clearly recite such a disk cooling device.

Non-limiting support for the subject matter amended to Claim 1 is found in Applicants' specification, on page 8, lines 13, 14, and 34-37, on the originally filed Claims 2 and 5, and on FIGS. 1 and 4. As such, no issues of new matter are believed raised by the instant amendment to the claims. Claims 2 and 5 are amended to conform with the changes made to Claim 1.

As shown in FIG. 7 of the specification, the link bushings 110 in AAPA are not in radial alignment with the cooling cavity 108 formed between the plates 100. Because of this, the air flow coming from the link bushings is subjected to a large change in direction, giving rise to the above-noted head losses and reduced performance. Moreover, the cooling device of FIG. 7 is formed by three plates (whereas the device of the present invention is formed by only two plates). The two downstream plates of AAPA do not extend from the downstream flange of the bottom platform 102 (they extend from the bushings 110). As such, Applicants respectfully submit that presently amended Claim 1 is not anticipated by AAPA. Claim 2, 3, 11, and 12 should be allowed over AAPA at least because of their dependency from Claim 1.

Turning to Lee, that reference fails to disclose a sealing device extending longitudinally between upstream and downstream plates so as to close the cooling air cavity formed by these plates in a leaktight manner as recited in Claim 1. Indeed, in Lee, conduit 60 is not closed in a leaktight manner because, as shown by the arrows in FIG. 2 of that reference, air can flow from orifice 78 through the downstream passages 76 after leaking

passed labyrinthian seal arrangement 67.[3] Also, there is no hole leading into the conduit 60 and opening out towards the first disc 18. Furthermore, the cavity 60 is not formed by two zones in communication with a plurality of openings as now recited Claim 1. Thus, Lee cannot support a prima facie case of anticipation of Claim 1. Claims 2, 3, 11, 12, and 14 are patentably distinct from Lee at least because of their dependency from Claim 1.

As to Correa, the outstanding Office Action asserts that the inner band 20c of the nozzle 20 is the recited platform and that the recited cooling cavity is a cavity formed inside of the nozzle 20. Applicants respectfully disagree. The recited platform is not the vane itself, but a structure for supporting at least one fixed vane of the low-pressure turbine. In addition, the recited cooling cavity is formed by the upstream and annular plates extending radially from upstream and downstream flanges from the support platform. In Correa, the "nozzle 20 is conventionally formed in arcuate segments or groups of the vanes 20a, which for example may include vanes 20a per segment, with adjacent ones of the segmented arcuate outer and inner bands 20b, 20c being suitably joined together to form a complete ring as is conventionally known."[4] Thus, the asserted cavity of Correa is internal to nozzle 20 and is not formed by upstream and downstream plates extending from a vane support platform. In other words, the upstream and downstream plates are pieces which are distinct from the vane. In addition, Applicants respectfully submit that Correa fails to disclose air orifices formed through the bottom annular platform of the vane for feeding the device with cooling air. It also fails to disclose that the cooling cavity is formed by two zones in communication via openings as now recited in Claim 1.

[3] Lee, col. 3, lines 65-68.

[4] Correa, col. 3, lines 15-20.

Accordingly, based at least on the foregoing, Applicants respectfully submit that Claim 1 is not anticipated by AAPA, Lee, or Correa. Claims 2, 3, 11, 12, 14, and 15 should be allowed, among other reasons, as depending either directly or indirectly from Claim 1, which should be allowed as just explained. In addition, Claims 2, 3, 11, 12, 14, and 15 are further considered allowable as they recite other features of the invention that are not disclosed, taught, or suggested by the applied reference when those features are considered within the context of the subject matter recited in independent Claim 1. Therefore, Applicants respectfully request that the anticipation of Claims 1-3, 11, 12, 14, and 15 under 35 U.S.C. §102(b) be withdrawn.

Finally, Applicants have submitted new Claims 16-20. Non-limiting support for the new claims is self-evident from the subject matter disclosed in the originally filed claims and on page 8, line 34 - page 9, line 11 of the Disclosure. Therefore, new Claims 16-20 are not believed to raise a question of new matter.[5]

New independent Claim 16 recites a cooling device to cool a high-pressure turbine disc and a low-pressure turbine disc of a turbomachine, comprising, among other features, upstream and downstream annular plates forming an air cavity with a platform configured to support at least one fixed vane of the turbomachine, the air cavity comprising a top portion and a bottom portion, the top portion being configured to be supplied with air from orifices in the platform and being in communication with the bottom portion via a plurality of openings, and the bottom portion, the air orifices, and the plurality of opening being in radial alignment with respect to each other; a sealing element extending between the upstream and downstream plates so as to seal the air cavity; and a plurality of holes disposed on an external

[5] See MPEP 2163.06 stating that "information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter."

wall of the bottom portion of the air cavity, the plurality of holes being configured to eject cooling air from the air cavity to cool the high-pressure and low-pressure turbine discs.

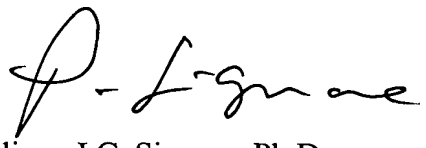
Based at least on the above-noted remarks, applicants respectfully submit that Claim 16 is neither anticipated nor rendered obvious by the art of record. New Claims 17-20 depend from Claim 16.

Consequently, in view of the present amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-20 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicants' undersigned representatives at the below listed telephone number.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Philippe J.C. Signore, Ph.D.
Attorney of Record
Registration No. 43,922

Mardson Q. McQuay, Ph.D.
Registration No. 52,020

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

PJS/MQM:fm
I:\ATTY\MQM\24'S\248849US\AMD 9-30-05.DOC